

The NowCast System

Predicting Water Quality at California Beaches



Presentation to the State Water Resources Control Board

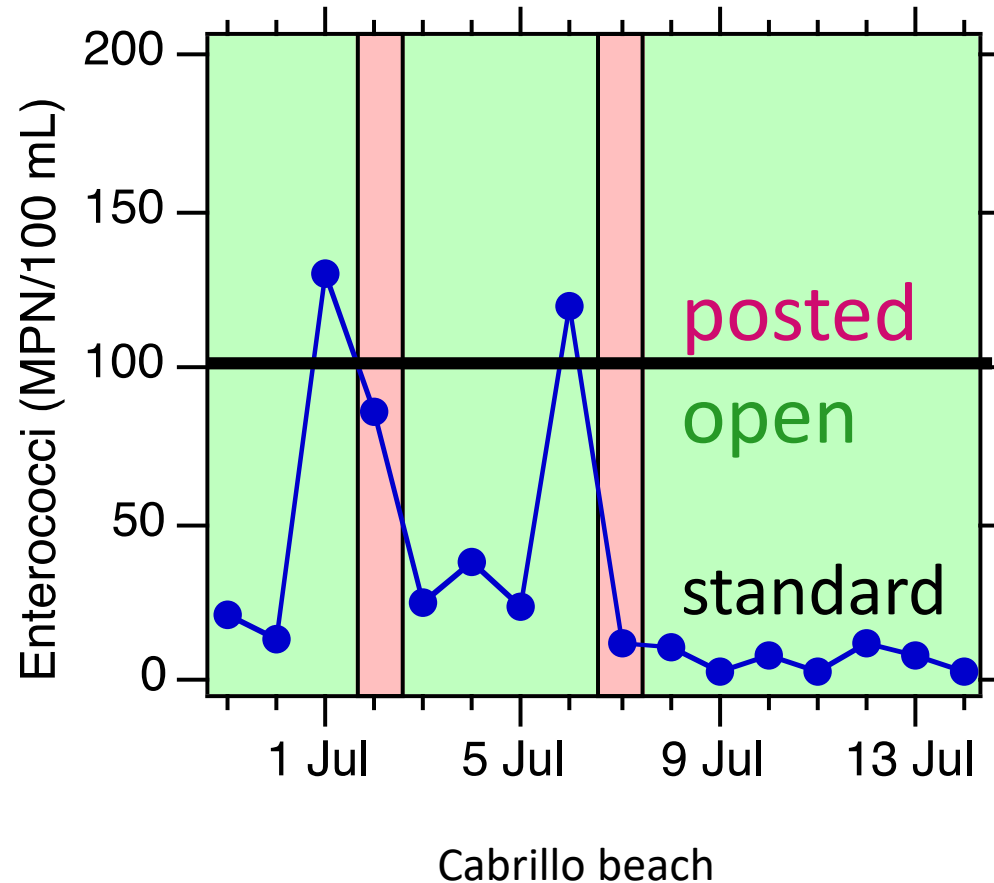
September 4th, 2018 – Item 6

Background



State law requires beaches be monitored for fecal indicator bacteria to protect public health

450 CA beaches monitored weekly in the dry season



24 h lag
between
sampling and
management
decision results
in errors

Problem extends to the entire nation

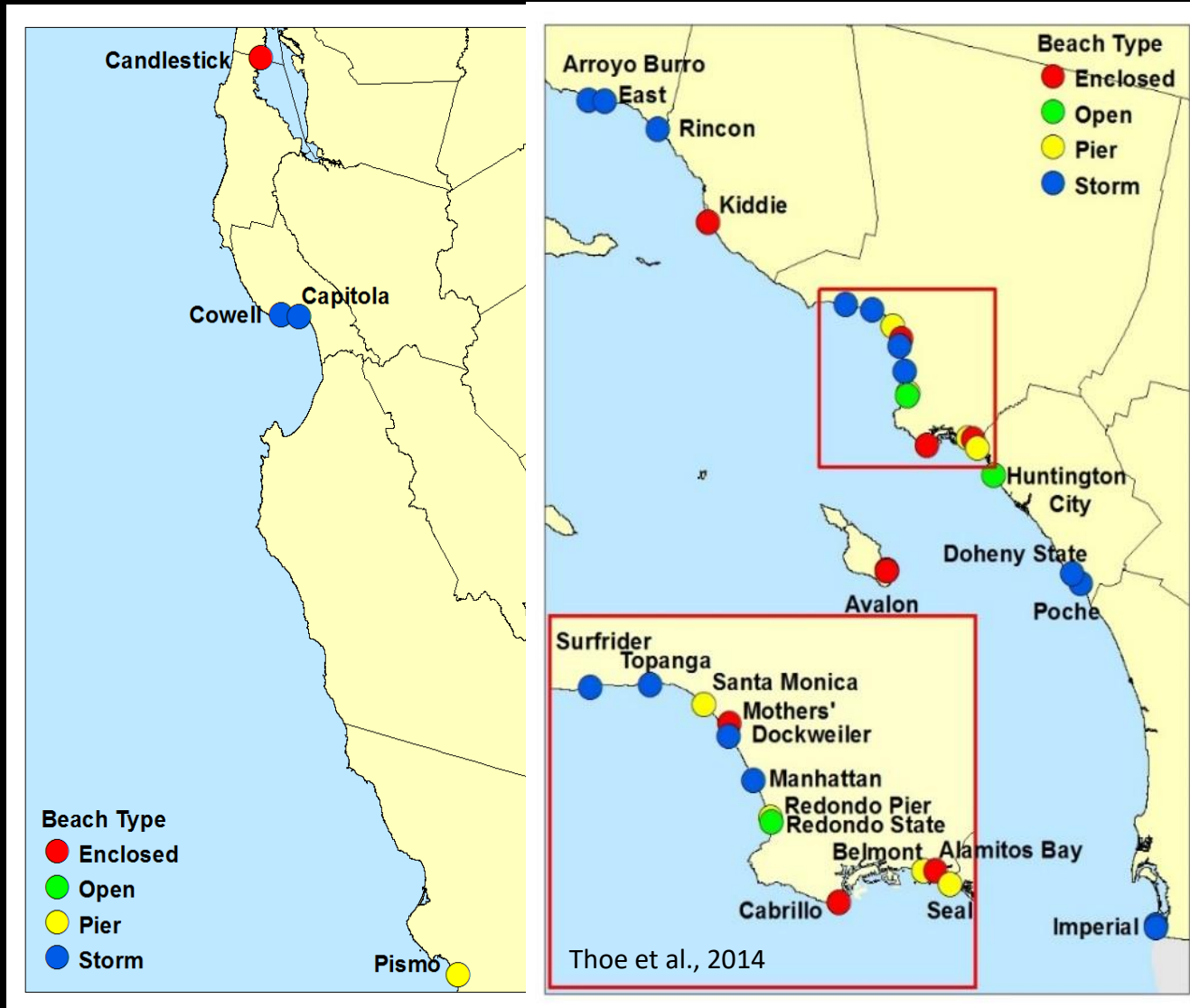


EPA 2012 ambient water quality criteria recommends predictive models to improve notification programs

ENT concentration = $1.94 + 1.6 * [\text{tide level}] - 0.15 * \text{water temperature}$

Are predictive models useful for California beaches?

Phase I

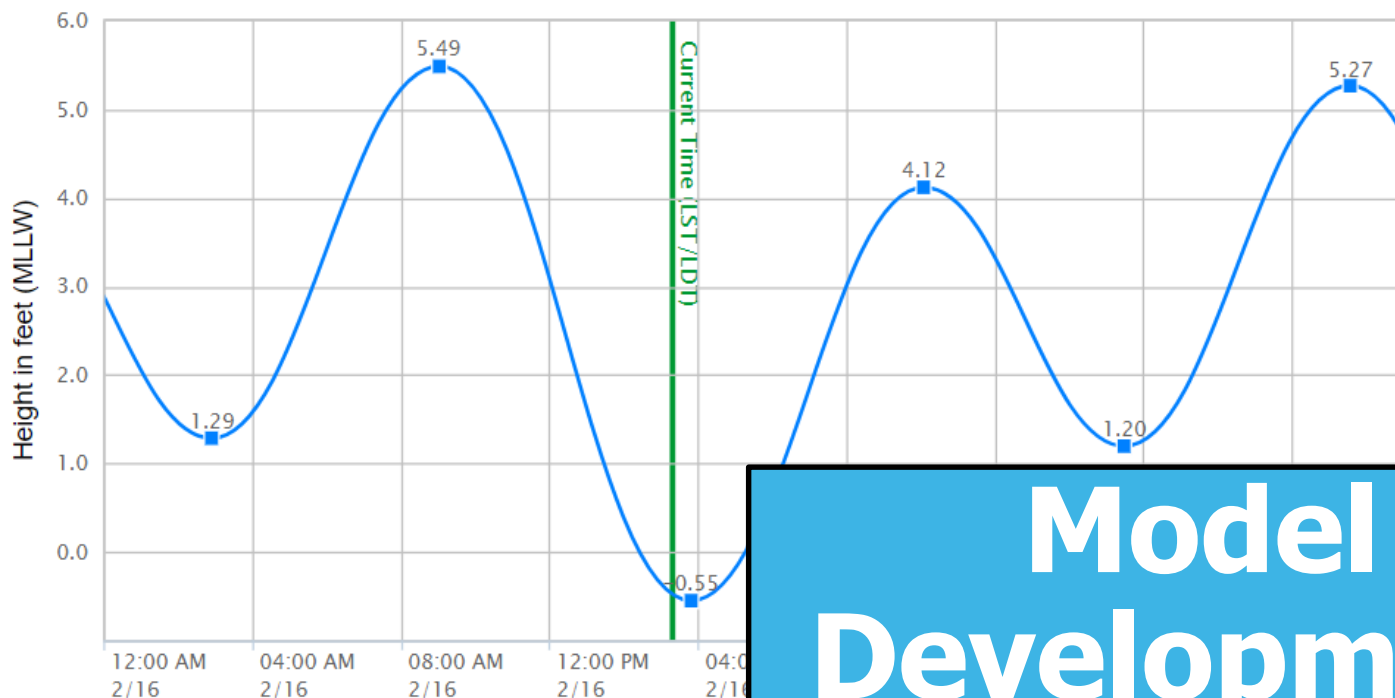


Phase II



Phase III





Model Development

HYPERION SHORELINE BACTERIA SAMPLES

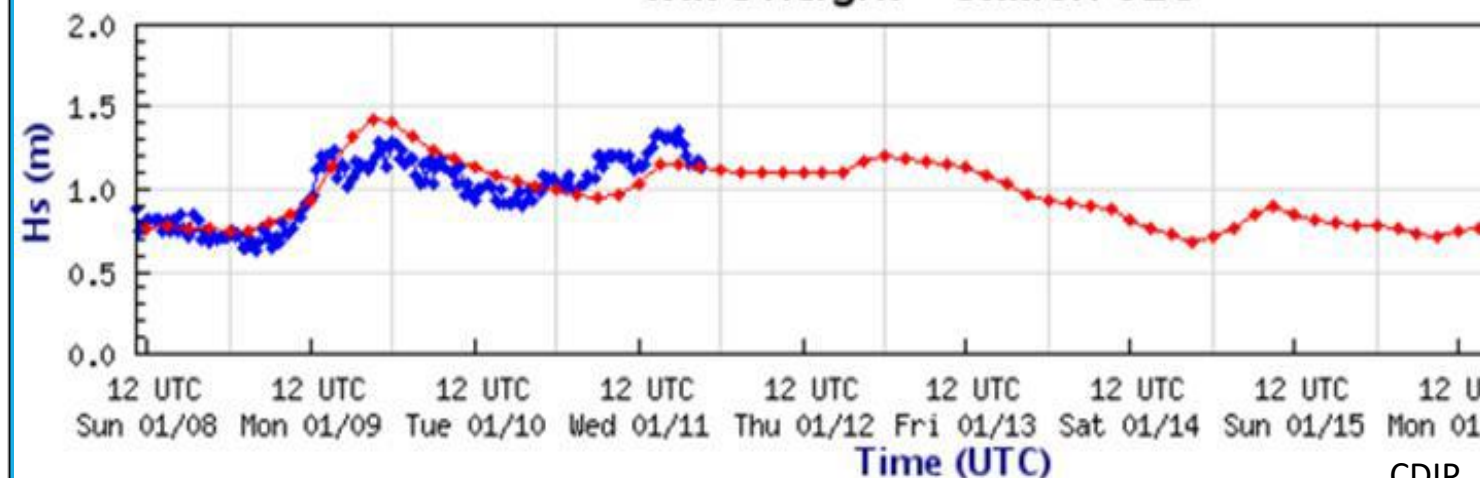
Hyperion Shoreline - S1 (SMB TMDL: SMB-MC-2) Malibu Crk, Malibu Lagoon County Bch Pt. Zero	Tot Ec Ent	> 	13,000 280 10	a X
Hyperion Shoreline - S2 (SMB TMDL: SMB-1-18) Topanga Cyn, Topanga County Bch Pt. Zero	Tot Ec Ent	 	1,000 430 87	b X
Hyperion Shoreline - S3 (SMB TMDL: SMB-2-04) Pulga Cyn SD, Will Rogers SB Pt. Zero	Tot Ec Ent	 	 	
Hyperion Shoreline - S4 (SMB TMDL: SMB-2-07) Santa Monica Cyn SD, Santa Monica SB Pt. Zero	Tot Ec Ent	< < <	67 67 10	
Hyperion Shoreline - S5 (SMB TMDL: SMB-3-03) Santa Monica Cyn SD, Santa Monica SB	Tot Ec Ent	 	1,500 1,100 53	a b X
Hyperion Shoreline - S6 (SMB TMDL: SMB-3-04) Santa Monica Cyn SD, Santa Monica SB	Tot Ec Ent	> >	13,000 3,900 2,000	a b c



Santa Monica Bay, CA Conditions + Forecast

Observations: C
Forecast: NOAA

Wave height - Station 028



NowCast for Manhattan (28th St) (Date: 02/16/2018)

Collecting environmental data:

Grabbing wave parameters at CDIP buoy 028 for a sample time

Wave variables obtained

Tide variables obtained

Weather variables obtained

Checking rain advisory status:

Manhattan (28th St) is not under a rain advisory

Environmental data collected and saved to Manhattan_(28th_St)

Running FC model (Manhattan (28th St)):

	Coefficient	Value
Variable		
rainH_b	0.412	0.00000
lograin4T	0.097	-2.30103
pres1	-0.459	30.10000

Constant: 15.731

PM: 1.415

FC (Predicted): 248 CFU/ 100 mL

Posting Decision: No Post

Running ENT model (Manhattan (28th St)):

Publish

← Back to results

Santa Monica Beach at the Pier



NowCast

12 hours ago



Good

Dry Grade

4 days ago



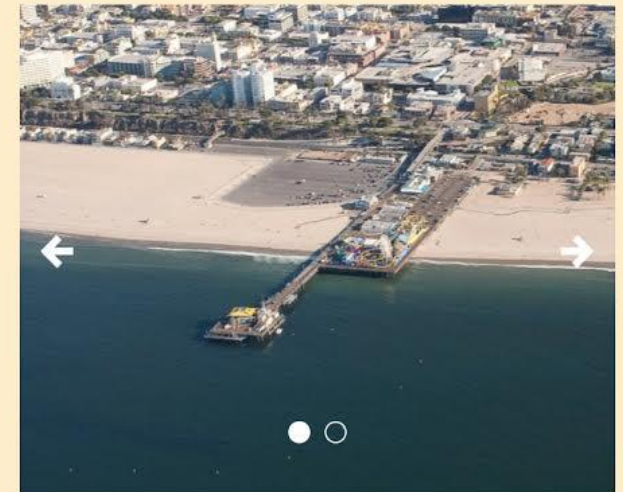
C

Wet Grade

4 days ago

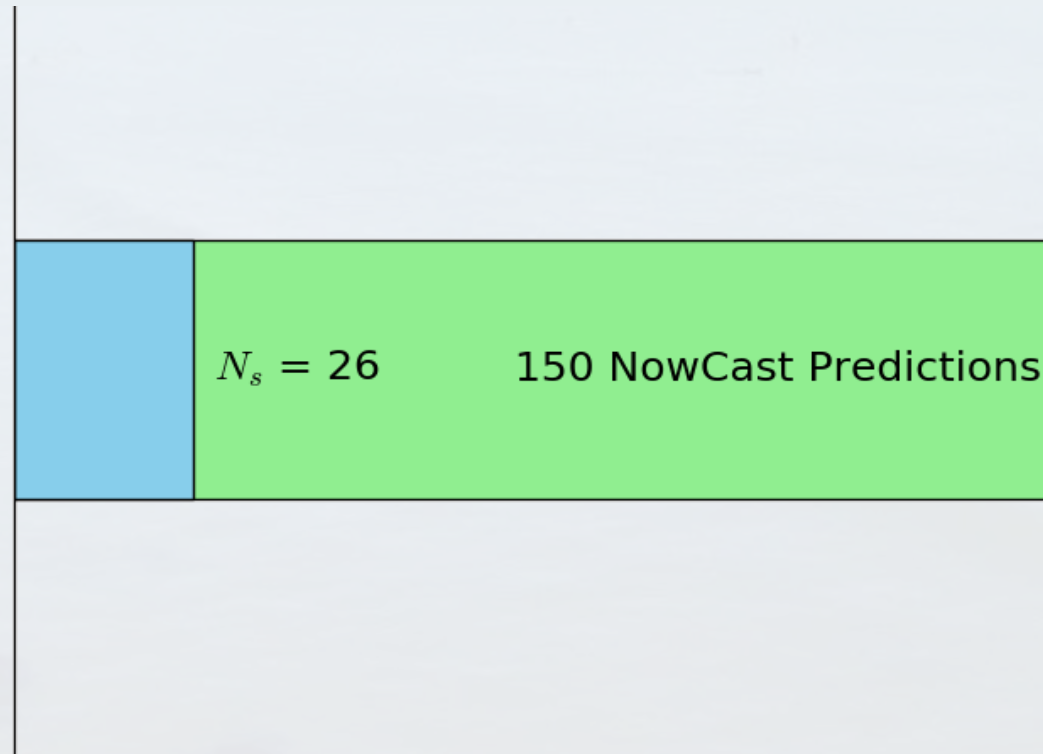


ns



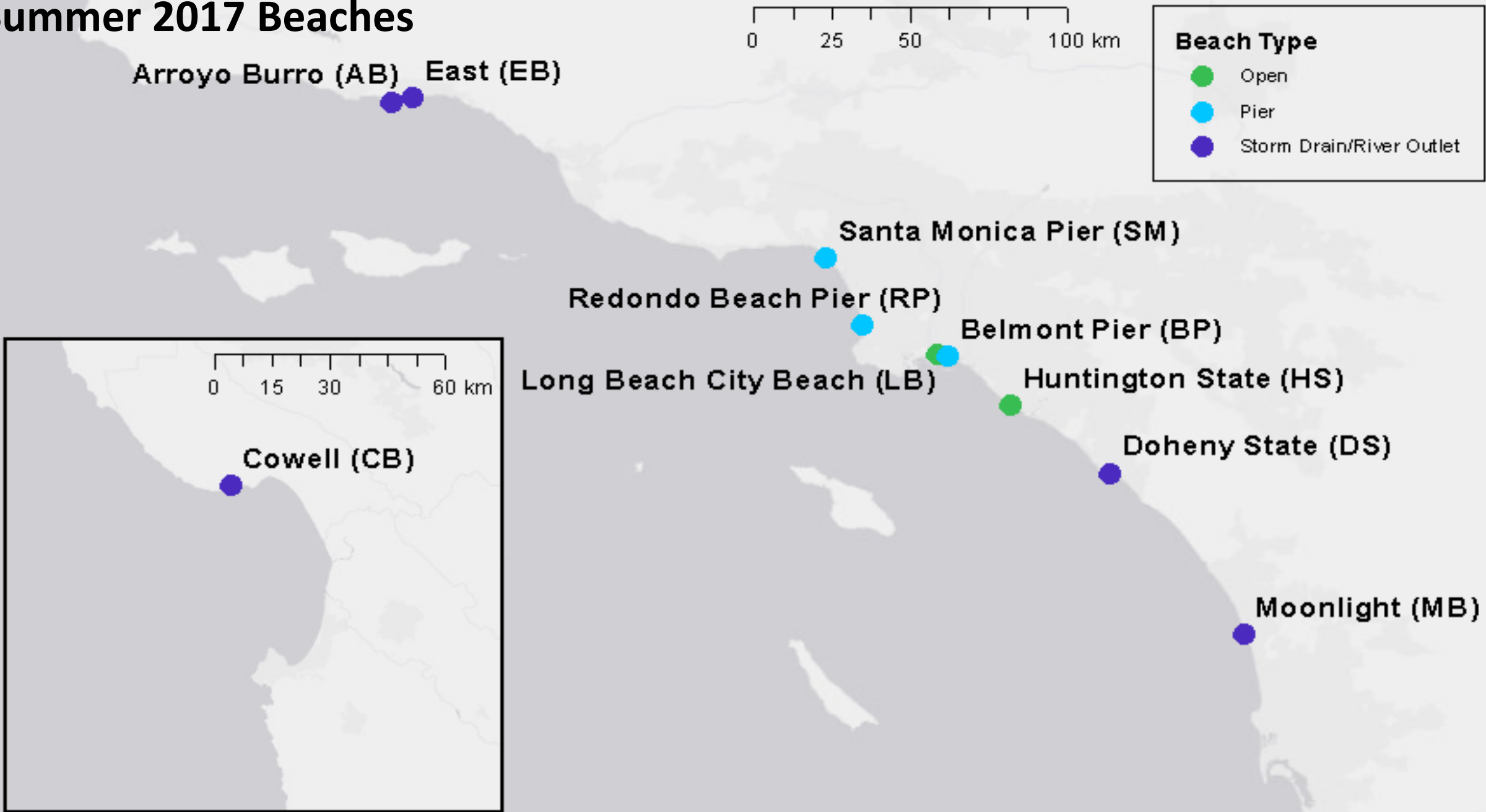
Cowell Beach

124 Additional Predictions Beyond Sampling



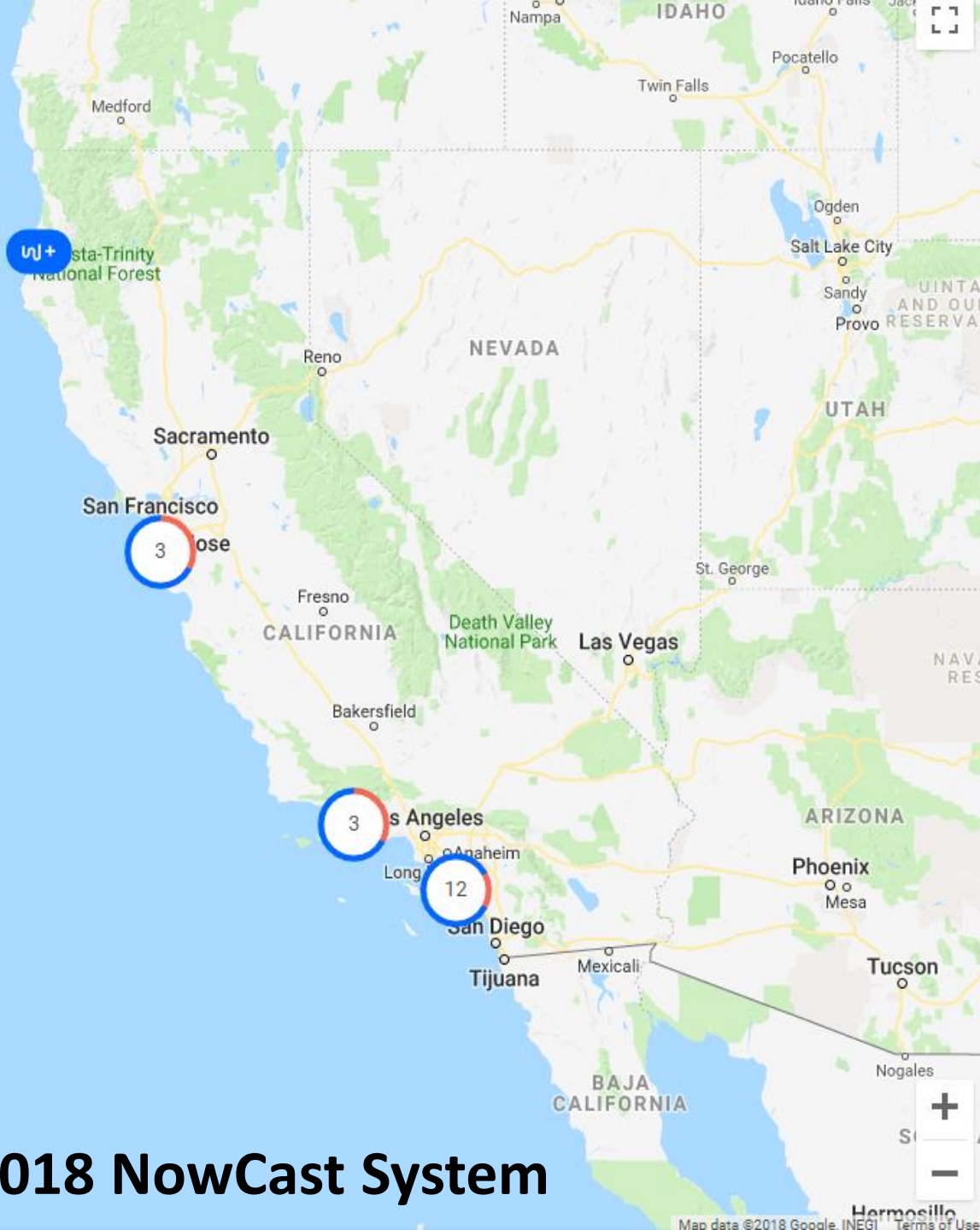
Summer 2017

Summer 2017 Beaches



BEACH REPORT CARD

WITH
NOWCAST



Search For Your Favorite Beach



All

NowCast

Grades

Alerts



Huntington State Beach
projection of Brookhurst St.

NowCast: **Good**
8 hours ago



Redondo State Beach
100 yards south

NowCast: **Poor**
8 hours ago



Manhattan Beach
projection of 28th

NowCast: **Good**
8 hours ago



Venice City Beach
at the pier

NowCast: **Good**
8 hours ago



Santa Monica Beach
at the Pier

NowCast: **Good**
8 hours ago



Doheny State Beach
San Juan Creek Interface

NowCast: **Good**
8 hours ago

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Summer 2018 NowCast System

Google

Map data ©2018 Google, INEGI, Terms of Use



Summer 2018 Beaches



1. Luffenholtz State
2. Ocean (Sloat Blvd.)
3. Cowell
4. Rio Del Mar
5. Arroyo Burro
6. Leadbetter
7. East (Mission Creek)
8. Santa Monica Pier
9. Venice Beach Pier
10. Manhattan (28th St.)
11. Redondo Beach Pier
12. Long Beach City Beach (5th Pl.)
13. Belmont Pier
14. Long Beach City Beach (72nd Pl.)
15. Seal Beach Pier
16. Huntington State (Brookhurst Ave.)
17. Doheny State
18. Oceanside (San Luis Rey River)
19. Moonlight

NowCast is a Comprehensive Program

1. Modeling Pipeline
2. Public Notification and Education
3. Beach Manager Communication
4. Technical Oversight

Endorsing NowCast

Benefits of NowCast to Public

- Improved accuracy
- Daily notification (as opposed to weekly/monthly)
- Earlier notification
- Weekend notifications
- Increased public awareness
- Improved understanding of FIB pollution

Benefits of NowCast to Beach Managers

- Daily notifications
- Public Notification on the NowCast/BRC webpage and app
- NowCast beach signs
- End of season report
- Continuous monitoring of model performance

Contact Info

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Beach Management Agency Partners



Website:

beachreportcard.org

Mobile app:

Available now on iOS and
Android platforms